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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/662,421

09/16/2003

Kenji Kamei

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02/11/2005

PILLSBURY WINTHROP, LLP

P.O. BOX 10500

MCLEAN, VA 22102

EXAMINER

CALEY, MICHAEL H

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 02/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/662,421

Applicant(s)

KAMEI, KENJI

Examiner

Michael H. Caley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 09162003
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

DETAILED ACTION

Claim Objections

Claims 5, 6, and 10 are objected to because of the following informalities:

In claims 5 and 10, “the radiators” lacks antecedent basis.

In claim 6 line 14, “light separation element” is followed by the reference character “13”.

The character should either be removed or enclosed within parenthesis. See MPEP § 608.01(m).

Appropriate correction is required.

Claim Rejections – 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4-6, 9-11, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwase (U.S. Patent No. 6,033,077) in view of Shiraishi et al. (U.S. Patent No. 6,394,608).

Regarding claims 1 and 6, Iwase discloses an optical engine which modulates a light ray from a light source (Figure 1 element 10) in accordance with an image signal and projects a result onto a screen, the optical engine comprising a housing (Figure 1 elements 20 and 30, there are provided in the housing:

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a dichroic mirror RGB light separation element (Figure 1 elements 12a, 12b, and 12c) which separates an incoming light ray from the light source into three primary color light rays;

a plurality of reflection type liquid crystal elements (Figure 1 elements 22a, 22b, and 22c) which are arranged in such a manner that the respective three primary color light rays enter from the light separation element, and emit reflected light rays modulated by the image signal;

a plurality of reflection polarizing plates (Figure 1 elements 21a, 21b, and 21c) to which the light rays separated by the light separation element respectively enter, which causes the incoming light rays to enter the respective liquid crystal elements, and transmit therethrough the reflected light rays from the liquid crystal elements; and

a combining prism (Figure 1 element 23) which combines the light rays transmitted through a plurality of the reflection polarizing plates and emits a resultant light ray.

Iwase fails to explicitly disclose the housing as forming a sealed space. Shiraishi, however, teaches the housing (Figure 9 element 15) as forming a sealed space in an analogous type of projector display having reflective liquid crystal elements (Column 5 lines 48-55).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed a sealed space from the housing as proposed. Shiraishi teaches a sealed housing as an advantageous feature for preventing dust accumulation (Column 2 lines 15-18). One would have been motivated to seal the housing space in the projection device disclosed

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by Iwase as a means of preventing the occurrence of shadows in an image due to dust (Shiraishi, Column 4 lines 48-50).

Regarding claims 4, 5, 9, and 10, Iwase fails to disclose the reflection type liquid crystal elements as fixed to radiators integrally attached to the housing and heat from the radiators as radiated to the outside of the housing and a ventilation path. Shiraishi, however, teaches such radiators (Figure 9 element 31) as a means of transferring heat generated in the liquid crystal panel outside of the housing (Column 7 lines 7-22) and a ventilation path (Figure 9 elements 6 and 11).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have fixed radiators to the reflection type liquid crystal elements and housing and ventilation path in the device disclosed by Iwase. One would have been motivated to provide such a cooling mechanism to maintain the liquid crystal elements at their normal operating temperatures (Shiraishi, Column 7 lines 1-6) while maintaining a sealed environment for the optical elements to prevent dust accumulation.

Regarding claims 11 and 13, Iwase discloses a housing having an incident opening from which a light ray from the light source enters and an outgoing radiation opening for the light ray (Figure 1 element 13A and 26) and a lens which is attached to the housing so as to close the incident opening and lead the light ray from the light source into the housing (Column 3 lines 44-55).

Claims 2 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwase in view of Shiraishi and in further view of Miyatake (U.S. Patent No. 5,327,270).

Iwase discloses polarizing plates arranged in light paths extending from the light separation element to the respective liquid crystal elements and used to control polarization characteristics of the respective liquid crystal elements (Figure 1 elements 20A, 20B, and 20C; Column 4 lines 28-43). Iwase fails to disclose a phase difference plate arranged as proposed. Miyatake, however, teaches such a phase difference plate placed in the light path as proposed as a means of preserving a high contrast of a projected image obliquely incident on the polarizing beam splitters (Figure 9 elements 68, 69, and 70; Column 7 line 67 – Column 8 line 28). Furthermore, Miyatake incorporates such phase difference plates in a projection device having analogous construction to that disclosed by Iwase, having obliquely arranged polarizing beam splitters and reflective liquid crystal elements.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have placed phase difference plates as taught by Miyatake in the light path of the device disclosed by Iwase as proposed. One would have been motivated to place the phase difference plate as proposed to benefit from an increased brightness and contrast level in the projected image according to the teachings of Miyatake.

Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwase in view of Shiraishi and in further view of Suzuki (U.S. Patent No. 6,280,036) and Borrelli et al. (U.S. Patent No. 6,654,168 “Borrelli”).

Iwase discloses the housing as including an incident opening from which the light ray from the light source enters (Figure 1 element 13A) and an outgoing radiation opening (Figure 1 element 26) from which the light ray from the combining prism outgoes. Iwase fails to disclose a sealed space as formed by closing the incident opening and the outgoing radiation openings by using the lens members. Shiraishi, however, teaches sealing the outgoing radiation opening by means of the projection lens (Column 6 lines 20-25) and the incoming opening by means of a cover glass (Column 6 lines 6-18). Suzuki teaches sealing the incident radiation path by means of a lens (Figures 6 and 8 elements 47, 48, and 49). Both Shiraishi and Suzuki teach sealing the optical paths as a means of preventing dust accumulation within the projector assembly (Shiraishi, Column 2 lines 15-18; Suzuki, Abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed the projection display device disclosed by Iwase to have sealing lenses at the incident and outgoing light radiation paths to the housing. Shiraishi and Suzuki teach a sealed housing as advantageous to prevent dust accumulation and subsequent degradation of the projected image. One would have been motivated to incorporate the teachings of Shiraishi and Suzuki to enable a seal at the light location paths.

Furthermore, Iwase fails to disclose optical elements other than the reflection type liquid crystal elements as made of inorganic materials. Borrelli, however, teaches inorganic optical elements as optimal for liquid crystal display projection applications due to degradation that occurs over time to organic materials used in such elements when used with an intense light source (Column 1 lines 8-32). Borrelli teaches an advantageous inorganic reflective polarizer element (abstract).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed the optical elements from inorganic materials as proposed. One would have been motivated to use inorganic materials as taught by Borrelli to avoid degradation of the optical components that may occur from use with an intense light source typical in projection devices.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Iwase in view of Shiraishi and in further view of Borrelli.

Iwase fails to disclose optical elements other than the reflection type liquid crystal elements as made of inorganic materials. Borrelli, however, teaches inorganic optical elements as optimal for liquid crystal display projection applications due to degradation that occurs over time to organic materials used in such elements when used with an intense light source (Column 1 lines 8-32). Borrelli teaches an advantageous inorganic reflective polarizer element (abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have constructed the optical elements from inorganic materials as proposed. One would have been motivated to use inorganic materials as taught by Borrelli to avoid degradation of the optical components that may occur from use with an intense light source typical in projection devices.

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Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael H. Caley whose telephone number is (571) 272-2286.

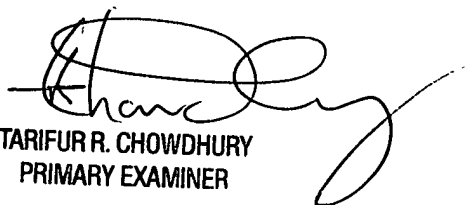
The examiner can normally be reached on M-F 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Michael H. Caley
February 3, 2005


mhc


TARIFUR R. CHOWDHURY
PRIMARY EXAMINER